ABSTRACT

Methods to generate modified polypeptides, modified antibodies, stably phosphorylated modified polypeptides, stably phosphorylated modified antibodies, polynucleotide sequences encoding the polypeptides, and uses thereof are provided. A computer-aided molecular modeling method is also provided to generate modified phosphorylatable polypeptides, particularly monoclonal antibodies (MAbs) for use in the diagnosis and treatment of cancers and other diseases. The corresponding MAbs contain heterologous recognition sites for polypeptide kinases and can be labeled by an identifiable label, such as radio-isotope ^{32}P. The phosphate group(s) attached to the phosphorylated polypeptide is unusually stable due to engineered intramolecular interactions between the phosphate group and its neighbouring groups. Polynucleotide sequences which encode a monoclonal antibody containing sequences encoding a putative phosphorylation site, and methods for analyzing the biochemical properties of a polypeptide by using molecular modeling tools, are also disclosed.